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PUBLIC HEALTH ADMINISTRATION IN SOUTH BEND, IND.

By CARROLL FOX, Surgeon, United States Public Health Service.

The following report gives the result of a study of public-health organization and administration in the city of South Bend, Ind., carried on throughout a period of approximately two months, from November 25, 1916, to January 31, 1917.

South Bend is situated in the northern part of Indiana, about 86 miles from Chicago, and on the St. Joseph River about 50 miles from its outlet into Lake Michigan. The St. Joseph River is not a navigable stream.

South Bend is a manufacturing center served by seven railroads—the New York Central, the Vandalia, the Grand Trunk, the Lake Erie & Western, the Chicago, Indiana & Southern, the New Jersey, Indiana & Illinois, and the Michigan Central.

Among its industries of magnitude may be mentioned the manufacture of wagons, plows, and other agricultural implements, watches, sewing machines, underwear, shirts, toys, electrical supplies, etc.

The population of South Bend, according to the estimate made by the United States Bureau of the Census as of July 1, 1916, is 68,946, of which approximately 50 per cent is foreign.

For information contained in this report the writer is indebted to the various city officials and other citizens of the community.

ADMINISTRATION AND ORGANIZATION.

The city health organization is under the administration of a board of health, which appoints a health officer as its executive officer. The board, together with its powers and duties, is provided for by statute.

Membership of the board.—The board of health consists of three members appointed by the mayor for a term of four years. At least two of these members must be physicians and not more than two must be of the same political party.

Meetings of the board.—The board of health meets once a month.

Salary of the members.—Each member of the board of health receives \$100 per annum.

The city health officer.—The city health officer is a part-time official appointed by the board of health for a term of four years. He must be a physician and may or may not be a member of the board of health. He acts as secretary and executive officer of the board. The compensation of the city health officer is computed on the basis of population, according to the United States census estimate, at a rate of 2 cents per capita per annum. The law provides that the salary shall not exceed \$1,500.

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Powers and duties of the health officer.—The powers and duties of the health officer as defined by State law are: To enforce the health laws, orders, ordinances, and rules of the local and the State board of health; to collect records and reports relating to "vital statistics;" to keep full and permanent records of public-health work; to keep minutes of all meetings of the board of health; to make monthly reports to the board of health of work performed by him or by his assistance; to make sanitary inspections and surveys of public buildings and institutions; to enter upon and inspect private property, at proper times and after formal notice, in regard to the possible presence, source, and cause of disease; to establish quarantine and order to be done what is reasonable and necessary for the prevention and suppression of disease, including the closing of schools and churches and the prohibiting of public gatherings; to order the abatement of any condition which may transmit, generate, or promote disease; to have charge of the city sanitary police force, meat and dairy inspectors, and the city plumbing inspector; to have charge of the laboratory; to have charge of the health office, and to carry out and perform all orders of the board of health.

Personnel.—The personnel of the city health department, exclusive of the board of health, together with their respective salaries, is at present as follows:

1 health officer, part time.....	\$1,359.72
2 sanitary policemen, at \$900.....	1,800.00
1 food inspector.....	900.00
1 plumbing inspector.....	1,200.00
1 clerk.....	720.00
Total.....	5,979.72

The sanitary policemen and the food inspector are detailed from and paid by the police department.

Office hours of the department.—The office hours of the health department are from 8 a. m until 5 p. m. with one hour for lunch, every day, except Saturdays, Sundays, and holidays. On Saturday afternoon after 1 o'clock there are two employees on duty—one for field and one for office work. On Sundays and holidays the office is closed.

Every employee of the health department may be granted two weeks' leave a year at full pay.

Office space is provided in the city hall.

Transportation.—The health department owns and maintains a two-passenger automobile for the use of one of the sanitary policemen. The plumbing inspector owns a motorecycle, and the expense

of maintaining the same is borne by the city. Inspectors of the health department may ride free of charge on the street cars.

Discussion.—As a result of the study of health organization and administration it is evident that the city should provide itself as soon as possible with a full-time health officer. It is quite impossible for a health officer who is also a practicing physician and who must depend upon his practice for a livelihood to devote the time necessary to properly administer his department or to plan and carry on the numerous activities required. A full-time health officer in a city the size of South Bend should be able to perform the administrative duties as well as those required of an epidemiologist, and should be able to act in a professional capacity at those public-health dispensaries which every health department should maintain—namely, an antituberculosis and a child-welfare dispensary. The salary which such an official is entitled to is not less than \$2,500 per annum.

At present the State law does not permit the employment of a full-time health officer, but there is now a bill before the legislature making provision for such a position, and it behooves all citizens interested in public health to lend their assistance to make that bill become a law.

The State constitution does not permit of the appointment of a public official for a term of office longer than four years. Thus a full-time health officer who has made good will, at the end of his term, be at the mercy of the appointive power, who may place political expediency ahead of efficiency. This is unfortunate, but can not be helped without a change in the constitution.

The health officer is likewise handicapped in that not sufficient money is appropriated to employ additional and necessary assistants to carry on the work of his department.

Proper office space has not been allotted to the health department. The office used at present is inadequate and too public. It is impossible to do any thorough work with repeated interruptions.

THE REGISTRATION OF BIRTHS AND DEATHS.

The registration of births and deaths is carried on by the local board of health under the authority of State law. Certificates are transcribed into a register and forwarded to the State board of health monthly.

Registration of deaths.—During the year 1916 there were registered with the local board of health 871 deaths, exclusive of stillbirths, making a crude death rate of 12.6 per thousand.

Approximately 547, or 62.6 per cent, of the total number of deaths were due to causes which may be classed as preventable.

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Among infants under 1 year of age there were 203 deaths, making an infant mortality rate of 110.6 per thousand registered births.

Registration of births.—During the year 1916 there were registered with the local board of health 1,835 births, exclusive of stillbirths, making a birth rate of 26.6. There were 80 stillbirths reported.

The following table contains information relative to morbidity and mortality statistics compiled from reports on file in the health department:

Disease.	Number of deaths, all ages.	Death rate per 100,000.	Number of cases reported.	Indicated case-fatality rate per 100.	Total deaths of infants under 1 year of age.
Tuberculosis, pulmonary.....	67	97.1			2
Tuberculosis, other forms.....	22	31.9			4
Typhoid fever.....	18	26.1	75	24.0	0
Diphtheria.....	24	34.8	160	15.0	1
Scarlet fever.....	4	5.8	154	2.6	0
Measles.....	3	4.3	849	.35	0
Cerebrospinal meningitis epidemic.....	2	2.9	2	100.0	0
Whooping cough.....	1	1.4	34	2.9	1
Erysipelas.....	2	2.9	1		0
Mumps.....	0	0	8		0
Chicken pox.....	0	0	84		0
Infantile paralysis.....	0	0	14		0
Smallpox.....	0	0	8		0
Influenza.....	10	14.5			0
Syphilis.....	6				2
Tetanus.....	3	4.3			3
Meningitis (tubercular excepted).....	10				7
Pneumonia.....	84	121.8			22
Diarrhea and enteritis.....	81	117.4			65
Other infections.....	21				3
Malignant growths.....	52	75.4			0
Accidental.....	45	65.2			3
Accidents due to occupations.....	2				0
Premature births.....	47				17
Rickets.....	2				2
Convulsions, marasmus, malnutrition, etc.....	12				12
Other causes peculiar to early infancy.....	29				29
Total.....	547				203

EPIDEMIOLOGICAL ACTIVITIES.

Report of Diseases.

Requirements of law and regulations.—The requirements relating to the reporting of diseases are based on law and the rules and regulations of the State board of health. Under this authority the following diseases must be reported to the health officer by the attending physician or some member of the household:

Yellow fever.

Smallpox.

Cholera.

Diphtheria.

Membranous croup.

Scarlet fever.

Measles.

Trachoma.

Syphilis.

Gonorrhea.

Typhus fever.

Bubonic plague.

Leprosy.

Cerebrospinal fever.

Epidemic poliomyelitis.

Pulmonary consumption.

Typhoid fever.

Chicken pox.

Whooping cough.

Contagious ophthalmia (pink eye).

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Methods of procedure.—In reporting diseases physicians make use of the telephone. Upon receipt in the health office of such information it is noted on a blank morbidity report which contains spaces for the address, name, age, sex, and color of the patient, physician's name and address, etc. A record of the case is then entered in a book. The morbidity reports are sent to the county health commissioner monthly.

Control of Diseases.

The methods used in handling the communicable diseases are provided for by State law and regulations of the State board of health. The procedure in the case of the more common diseases is shown in the tabulation. There are practically no epidemiological investigations made except in the case of typhoid fever, and then only in a superficial way. Placards are placed and fumigations performed by the sanitary policemen.

The following-named diseases are reportable and quarantinable:

Yellow fever.	Smallpox.
Cholera.	Diphtheria.
Membranous croup.	Scarlet fever.
Epidemic poliomyelitis.	Cerebrospinal fever.
Typhus fever.	Bubonic plague.
Leprosy.	

The following diseases are reportable and placardable:

Chicken pox.	Whooping cough.
Measles.	Mumps. ¹

The following are reportable only:

Pulmonary consumption.	Gonorrhea.
Typhoid fever.	Syphilis.
Pellagra.	

Tuberculosis.—During the year 1916 there were registered with the health department 67 deaths from pulmonary tuberculosis, making a death rate of 97.1 per 100,000. The figure includes those deaths occurring at the county sanatorium in patients who were sent to that institution from the city of South Bend. During the same period there were reported to the health department but 26 cases. There were 22 deaths due to other forms of tuberculosis, making a death rate for tuberculosis, all forms, of 129 per 100,000. Except to fumigate after death or removal of a patient the city health department exercises no supervision over cases of tuberculosis. There is, however, a charitable organization carrying on some antituberculosis work. There is also an excellent institution maintained by the county for the isolation of advanced and incipient cases of tuberculosis.

¹ By a ruling of the local board of health.

Antituberculosis league.—This society is supported by private philanthropy. A dispensary is maintained in the courthouse, at which patients desiring admission to the county sanatorium are examined and passed upon by the physician in charge of the sanatorium. Other patients are referred by the league to one of the practicing physicians of the city, who receives a nominal fee for his services. The society also carries on educational work relative to the prevention of tuberculosis and issues antituberculosis supplies. The field work is performed by the nurses of the visiting nurse association, for which services the association is reimbursed by the antituberculosis league.

Before the erection of the county sanatorium the antituberculosis league maintained a camp for the isolation and treatment of the tuberculous. It was through the efforts of the members of this league, as well as of other public-spirited citizens, that the county was prevailed upon to erect and maintain the present institution after a law had been enacted by the legislature providing for county sanatoria.

Tuberculosis sanatorium.—The tuberculosis sanatorium is owned and maintained by the county of St. Joseph and is located about 6 miles from the city of South Bend. It comprises a central portion, in which are offices, a dispensary, quarters for the doctor and nurses, and the main kitchen and dining room. From each side there extends a wing designed to accommodate both male and female patients. One wing is used for the isolation of incipient, the other for advanced, cases. The building for advanced patients contains a passageway running its entire length. Opening into this corridor to the rear are a locker room, bath, toilets, diet kitchen, etc., while in front are sleeping porches, rooms in which patients may be taken during inclement weather, and a small ward which is at present used for children. The wing for incipient cases has the alleyway running the entire length of the building, with toilet facilities and lockers to the rear and in front two large open wards separated by a lounging room for patients. The hospital is screened against flies.

Steam is used for heating such parts of the building as must be kept warm—namely, the administration building, bathrooms, and lounging rooms. In addition there are 10 one-room cottages built for the care of tuberculosis patients and warmed by stoves. The water supply is derived from a driven well. The building contains a modern system of plumbing. Sewage is emptied into the St. Joseph River untreated. Garbage is dumped along the edge of the river. The building is lighted by electricity from the plant furnishing light to the city of South Bend, and acetylene manufactured on

YOUR PATRIOTIC DUTY—BUY A 1917 LIBERTY BOND.

the premises. Acetylene is also used for heating the stoves in the diet kitchen.

A chicken farm is maintained in connection with the institution, as well as a truck garden. The sanatorium was planned to accommodate 44 patients, exclusive of those in the cottages. Including those in the cottages there are at present 56 patients receiving the benefits of the institution. The nursing staff is composed of individuals who have been at the institution for treatment and who are given a training by the head nurse.

The last statement of the costs of maintaining this institution for a monthly period shows that the entire expense amounted to \$1,922.26, which figure includes a small amount for repairs, but not interest on money invested nor allowance for depreciation. The cost per patient per day was \$1.09. During the same period there was derived an income from patients amounting to \$748, which reduces the cost to the county to 69 cents per patient.

The county sanatorium is an institution in which the locality may justly take pride, and it is to be hoped that it will be permitted to expand so that a greater number of the tuberculosis patients of South Bend and the county may be isolated and cared for.

Typhoid fever.—There were 18 deaths from typhoid fever registered with the health department during the year 1916, making a death rate of 26.1 per 100,000. During the same period there were reported 75 cases of the disease. The case fatality rate was therefore 24 per cent. This rate is unusually high and can be accounted for only by assuming that there were a number of unreported, unrecognized, or concealed cases. It is not surprising that typhoid is endemic in South Bend nor that it should at times assume epidemic proportions. At the time of writing this report (January, 1917) there are in the city 25 known cases of typhoid fever, only a few of which have been brought in from neighboring communities. Every factor involved in the continuance of typhoid fever is present, including the insanitary privy, the surface well, fly-breeding material, and a milk supply part of which only is pasteurized. Added to this is the lack of supervision and investigation of cases.

The epidemiological studies carried on are very inadequate. When a surface well is present on the premises a sample of water is taken and information may be obtained relative to the milk consumed by the household.

Diphtheria.—During 1916 there were registered with the health department 24 deaths from diphtheria, making a death rate of 34.8 per 100,000. During the same period there were reported 160 cases, giving a case fatality rate of 15 per cent—a figure showing that there were cases not reported, that antitoxin was not used sufficiently early

in the disease, or that it was used in insufficient quantities. No epidemiological studies are made in the case of diphtheria. Houses are placarded and fumigated by one of the sanitary policemen. Quarantine is raised after the finding of two negative cultures taken not less than 24 hours apart. The first culture is obtained by the attending physician and the second culture by one of the nurses of the visiting nurse association. Antitoxin is furnished by the city free of charge in indigent cases upon application of the attending physician.

Smallpox.—There were reported during the year 1916 eight cases of smallpox and no deaths. Five of the eight cases were isolated in the hospital provided for the purpose. Three cases were isolated at their homes.

Isolation hospital.—The isolation hospital is located not far from the tuberculosis sanatorium and is owned by the county but maintained by the city of South Bend. It is used for the isolation of smallpox only, for both county and city patients. It consists of a central portion used for administrative purposes and as the residence of the caretaker. From each side there extends a ward designed to accommodate six patients, one side being used for male and one for female patients. This hospital is constructed of brick, contains modern plumbing, a water supply derived from a well, and is steam heated. The sewage is discharged into the St. Joseph River untreated.

Infant mortality.—During 1916 there were registered with the health department 203 deaths of infants under 1 year of age, giving an infant mortality rate of 110.6 per thousand births. The principal causes of these deaths were: Diarrhea and enteritis, 65; pneumonia, 22; prematurity, 47. There is no work being carried on by the health department along the lines of child welfare.

The children's dispensary.—There is, however, a children's dispensary, or what might be termed a child's welfare station, maintained by a charitable organization. It is located in a part of the city populated by the poorer people. This dispensary is open twice a week in winter and more frequently during the warm weather. Physicians give their services free of charge. Cases needing surgical attention are referred to the hospital. Medicines, dressings, and milk for infant feeding are furnished without cost. Instruction is given to mothers relative to the care of the infant, and the society employs a nurse to make follow-up visits to the home.

The visiting nurse association.—The visiting nurse association employs two nurses, who are paid out of the funds of the society. These nurses visit the indigent sick upon requests received from various sources and render the necessary nursing care during such visits. By

YOUR PATRIOTIC DUTY—BUY A 1917 LIBERTY BOND.

arrangement, they also visit cases for the Metropolitan Life Insurance Co. and act as visiting nurses for the antituberculosis league.

In addition to the above, by arrangement with the city health department, the nurses of the visiting nurse association take the second release cultures in cases of diphtheria.

The work of the visiting nurses during 1916 included nursing care on account of fractures, injuries, newborn children, maternity cases, post-operative cases, tuberculosis, typhoid fever, pediculosis, bronchitis, pneumonia, etc.

The society issues medicines and dressings free of charge, and also distributes antituberculosis supplies, furnished by the antituberculosis league.

During the year 1916 there were 4,747 visits made to 843 cases, averaging $6\frac{1}{2}$ visits a day for each nurse.

The Diagnostic Laboratory.

The laboratory used by the city of South Bend is operated by the physicians of the city and housed in one of the local hospitals. For work performed on account of public health the city pays from health department funds the sum of \$1,500 yearly. The room occupied by the laboratory is located in the basement. It is small, has a western exposure, and is, on the whole, not adapted to the purpose for which it is used. It is fairly well equipped to do most of the ordinary routine work required of a clinical or public-health laboratory, except the chemical examination of water and the Wasserman reaction. The bacteriologist is a full-time official.

The work done for the health department comprises the examination of water and milk and the examination of cultures for diphtheria, including cultures both for diagnosis and for the release of quarantine. A few examinations are made of sputum and of blood for tuberculosis or for typhoid fever and an occasional examination is made of some food product. The total number of examinations made for the health department during the year 1916 was 1,591, which would make the cost to the city for each examination about 94 cents. Reports from the laboratory during the year 1916 were not satisfactory. Recent changes, however, have resulted in a great improvement in this regard.

Tabulation ¹ of examinations made in the laboratory, calendar year 1916.

Samples of milk examined bacteriologically.....	493
Samples of milk examined chemically.....	375
Samples of milk examined for preservatives.....	1
Samples of cream examined for butter fat.....	5
Samples of cream examined for preservatives.....	1
Samples of ice cream examined.....	13

¹ Records are incomplete.

YOUR PATRIOTIC DUTY.—BUY A 1917 LIBERTY BOND.

Samples of butter examined.....	1
Samples of lard examined.....	2
Preserved pineapple examined.....	1
Samples of water examined:	
City water { colon present.....	0
{ colon absent.....	4
Well water { colon present.....	12
{ colon absent.....	11
Samples of water examined chemically.....	5
Samples of water examined from swimming pool.....	2
Sputum examinations.....	135
Throat cultures examinations.....	476
Widal reactions determined.....	54
	<hr/> 1, 591

Discussion.

After the health officer has been appointed on a full-time basis there should be added to the personnel of the health department a corps of five public-health nurses, who would be required to visit the homes of individuals to supervise the prophylactic measures taken in the case of certain communicable diseases, more especially tuberculosis, typhoid fever, and diphtheria, and to act as educators by taking their part—the most important part—in infant welfare and prenatal work. Thus the health department would be provided with an adequate staff to carry on public-health work according to modern views and would be able to assume its obligations to the public by performing those strictly governmental functions which now must be performed through the efforts of private philanthropy. It would also be well for the school department to combine its force of nurses with those of the health department so that all public nursing services will be under one directing head—the health officer. The city could then be divided into seven districts with a nurse in each to carry on within that district all the duties of a visiting nurse. In this way a nurse would become more familiar with her people and the people more familiar with the nurse. A duplication of visits would be avoided and it would mean in the end increased efficiency and economy.

In order that the health officer may perform his manifold duties effectively he should be provided with a small automobile.

Typhoid fever should be made a placardable disease.

The present arrangement with the laboratory seems to be satisfactory, but the scope and amount of work done for the health department should be increased.

Physicians should be encouraged to make use of the laboratory to assist them in diagnosis, especially of typhoid fever, diphtheria, tuberculosis, gonorrhea, and syphilis, and the laboratory should cooperate with the epidemiologist by adequate reports of examina-

YOUR PATRIOTIC DUTY—BUY A 1917 LIBERTY BOND.

tions performed. Such reports may be used in lieu of morbidity reports.

All laboratory work performed for the purpose of determining whether quarantine may be released or for the detection of carriers should be done in the laboratory authorized by the city health department, and when laboratory work is done by private laboratories for diagnostic purposes all positive results should be reported to the health department.

An isolation hospital in which to isolate the more common communicable diseases is badly needed. At present there is no place to which to take such cases even in emergencies, as when scarlet fever or diphtheria is found in a lodging house or hotel. A hospital of this kind should have not less than 20 beds and should be so located in the city that it may be reached with ease and dispatch.

THE WATER SUPPLY.

The water supply of South Bend is derived from a battery of cased driven wells averaging 100 feet in depth. These wells are true artesian in type, in that they flow and have a static head averaging 10 feet. They furnish an amount of pure water ample to the present needs of the city. During the year 1916 the average amount supplied to the city daily was 4,650,000 gallons, or about 67 gallons per capita. There is sufficient water in the water-bearing stratum to furnish an adequate supply to a city of 200,000 people. Water is furnished to different parts of the city under direct pressure. There are two pumping stations, one of new construction, housing steam-driven pumps, with a total capacity of 19,000,000 gallons daily. The other plant is much older. The pumps are operated by water power and have a capacity of 5,000,000 gallons daily.

Colon bacilli have never been detected in the city water supply and the bacterial count is always low. Because of the character of the source of water supply it has been thought unnecessary to make frequent routine tests as to purity.

THE DISPOSAL OF SEWAGE.

Requirements of ordinances.—Every dwelling house, hotel, factory, store, or other building in which plumbing arrangements are to be placed must be connected with the sewer where such is available. A sewer is to be deemed accessible when it is within 100 feet of any outside line of the lot upon which such building may be situated. Where a sewer is not available, the construction of a cesspool is permitted, the location and the material to be used in its construction to be provided for by ordinance.

YOUR PATRIOTIC DUTY—BUY A 1917 LIBERTY BOND.

In case any cesspool is allowed because of inability to connect with a sewer, such cesspool must be filled in and sewer connections made as soon as the sewer is available.

Privy vaults may be constructed only on premises where water and sewer are not accessible. Vaults now existing on premises accessible to a sewer must be cleaned to the bottom and filled with clean earth.

It is forbidden to construct any privy, privy vault, or cesspool within a sewer district of the city, and all water-closets and drains in such districts must be properly connected with the sewer.

All privy, privy vaults, or cesspools within a sewer district, closer than 50 feet to a residence, or permitted to become too full, or to emit noxious or offensive smells must be deemed a nuisance, and the owner must be required to clean out or remove the same and connect all water-closets or drains with the sewer.

Where any owner neglects or refuses to clean a privy, privy vault, etc., within 10 days after having received notice from the health department, that department is authorized to perform the cleaning and charge the cost as a lien against the property.

If any owner refuses to obey the order of the health department as above, he is liable to a fine of not to exceed \$50.

It is required that all hotels, restaurants, boarding houses, drinking saloons, store buildings, hospitals, or infirmaries be connected with the sewer where such is available. For failure to comply with an order to connect there is provided a fine of not to exceed \$100. Where a sewer is not available, the places mentioned above must be provided with a properly constructed privy, the vault of which must be sunk in the ground at least 6 feet deep and walled with brick, cement, stone, or solid plank and kept in a sanitary condition; and where such vault is permitted to become full or to emit noxious and offensive smells, it must be deemed a nuisance and the owner be liable to a fine of not more than \$50.

There are at present about 97 miles of sewers laid in the city of South Bend, including mains and laterals. The system is that whereby the same sewer conveys both sewage and storm water. Sewage is emptied into the St. Joseph River untreated. From records in the city engineer's office it is learned that the river has a dry-weather flow of 2,000 cubic feet per second. While there is, therefore, a sufficient volume of water to prevent a nuisance arising, it must not be forgotten that the pollution of the stream is continuous. The time will come when it will be necessary to treat the city's sewage before permitting it to pass into the river. This is a matter that even now should be given serious consideration.

YOUR PATRIOTIC DUTY—BUY A 1917 LIBERTY BOND.

Tabulation of State regulations for the

Disease.	Isolation of patient.	Quarantine of contacts.	Exclusion from school.	
			Patient.	Contacts.
Diphtheria....	Until 2 successive negative cultures are obtained from the nose and throat.	Children until death or recovery of patient, or until the receipt of not less than 1,000 units of antitoxin and disinfection.	Until a medical certificate stating that nose and throat are free from infection is furnished.	For 7 days after release from quarantine unless an immunizing dose of antitoxin has been received.
Scarlet fever...	For not less than 21 days after beginning of the disease.	During period of isolation.	Until 10 days after removal of quarantine.	Intimate contacts until 10 days after removal of quarantine; others, after removal from house and 10 days' observation.
Measles.....	Not less than 14 days, and until desquamation has ceased.	Not required.....	Until 5 days after the isolation period.	Yes, unless child is immune.
Smallpox.....	Not less than 21 days after beginning of disease, and until exfoliation is complete.	For 14 days from last exposure unless protected by a previous attack of the disease or a successful vaccination, or until a successful vaccination is obtained.	Until 7 days after the removal of quarantine.	Same as for quarantine of contacts.
Chicken pox...	Not less than 14 days from the beginning of the disease and until exfoliation is complete.	Not required.....	For period of isolation.	For 2 weeks unless immune.
Whooping cough.	Not less than 5 weeks from the beginning of the disease and until the "whoop" has ceased.	.....do.....	.....do.....	For period of isolation unless immune.
Typhoid.....	.....	.....	.....	.....
Tuberculosis...	.....	.....	May not attend school and can not be employed as teachers.	.....

YOUR PATRIOTIC DUTY—BUY A 1917 LIBERTY BOND.

control of the common communicable diseases.

Treatment of breadwinner.	To be reported.	Terminal fumigation.	School notified.	To be placarded.	Sale of food prohibited.	Public funeral prohibited.	Prohibited from working in places where food is handled.
May be released from quarantine after disinfection and must remain away during period of quarantine.	Yes.....	Yes.....	Yes.....	Yes.....	Yes, unless segregation of food, utensils, and person handling food is thoroughly carried out.	Yes.....	Yes.
May be released from quarantine after disinfection, and provided there is no contact with patient.	Yes.....	Yes.....	Yes.....	Yes.....	.....do.....	Yes.....	Yes.
No restrictions.....	Yes.....	None.....	No.....	Yes.....	No.....	No.....	Yes.
Same as for quarantine of contacts.	Yes.....	Yes.....	Yes.....	Yes.....	Yes, unless patient is removed to isolation hospital and contacts are vaccinated.	Yes.....	Yes.
No restrictions.....	Yes.....	None.....	No.....	Yes.....	No.....	No.....	Yes.
.....do.....	Yes.....	None.....	No.....	Yes.....	No.....	No.....	Yes.
.....	Yes.....	None.....	No.....	No.....	Same as for diphtheria.	No.....	Yes.
.....	Yes.....	Yes, after death or removal.	No.....	No.....	No.....	No.....	Yes.

YOUR PATRIOTIC DUTY—BUY A 1917 LIBERTY BOND.

It is a deplorable fact that there are a large number of insanitary privies in the city of South Bend, many of them located on premises facing streets that have been provided with sewers. Such a condition should not be permitted to exist. Night-soil collectors are required to secure a permit for each load. It is dumped at a place designated by and under the supervision of the department of public works.

COLLECTION AND DISPOSAL OF REFUSE.

The city collects its garbage, but has made no provision for the collection of rubbish.

Requirements of ordinances and rules.—The city ordinances governing the collection of garbage are summarized as follows:

Garbage is defined as kitchen and table refuse, swill, and any accumulation of animal and vegetable matter that attends the preparation, decay, and dealing in or storing meats, fish, fowl, or vegetable, but not dish or waste water.

Night soil is defined as the contents of privy vaults, cesspools, dry wells, and sinks.

Rubbish is defined as paper, rags, pasteboard boxes, berry boxes, sweepings, chips, tinware, leather, and other rubbish of all kinds.

All garbage, night soil, or other accumulations of vegetables, meat, except stable manure, and all dead animals must be burned in the garbage furnace of the city. Stable manure may be burned in such furnace, and swill may be disposed of by feeding to hogs outside the city limits, if hauled away in properly constructed wagons.

It is prohibited to throw any refuse in any street, alley, or public grounds, or into any running stream. It is likewise prohibited to burn any rubbish on any street, alley, public place, or upon any premises in open air.

It is the duty of every tenant or occupant of any private dwelling to provide a water-tight garbage receptacle not to exceed 20 gallons in capacity, with tight-fitting cover and handles. All garbage accumulated on the premises must be deposited in such cans and placed in a situation readily accessible to the collectors. It is prohibited to place anything but garbage in the garbage can.

Proprietors of hotels, butcher shops, commission houses, etc., must have garbage collected at their own expense.

The rules that have been adopted by the board of public works relative to the collection of garbage specify that garbage collectors are required to collect garbage from private residences only, and that hotels, saloons, boarding houses, etc., must remove the same at their own expense; that garbage must be put into a proper garbage tin, not to exceed 10 gallons in capacity, with tight-fitting cover; that garbage must be drained and wrapped in paper, and collectors are instructed to refuse to take garbage which is mixed with tins, broken dishes, etc.; that the garbage can must be placed so that it is easily accessible to the collector.

Method of procedure.—For convenience of collection the city is divided into three districts. Collections are made twice each week in those parts of the city close to its center and once each week elsewhere. There are three wagons owned by the city engaged in the work of collection. The body of the wagon is of steel with steel cover. It is of the end-dump type and has a capacity of 4 cubic yards or 2 tons. The driver, who furnishes his own team, is paid \$5 and his

YOUR PATRIOTIC DUTY—BUY A 1917 LIBERTY BOND.

helper \$2.25 a day. There is collected an average of six loads of garbage a day during the cold weather and 13 loads a day during the warm weather, representing 12 and 26 tons per diem, depending upon the time of the year.

Garbage is disposed of in two ways: Part of it is taken by the farmers to be used as fertilizer and at times, no doubt, to be fed to hogs, and part is incinerated. The incinerator is of the low-temperature type and was erected in 1903. It consists of 3 units located in series between a fire box and a combustion chamber. There is one man, a fireman, employed at the incinerator, who receives \$2.50 per diem.

The incinerator is operated about eight hours a day only, and its capacity is, therefore, not overtaxed and no nuisance is produced. A few complaints have been registered with the health department, but these have arisen because rarely garbage has been dumped at the incinerator awaiting transportation by the farmer. Ordinarily the farmer hitches his team to the garbage wagon, takes it to the farm, dumps the garbage, and returns the wagon. The cost to the city for the collection and disposal of garbage during the year 1916 was \$8,403.

Discussion.—It is probable that in the city of South Bend there is approximately an average of 36 tons of garbage produced per diem on a basis of a half ton of garbage per 1,000 inhabitants. An inspection of the city makes it obvious that much of this garbage is uncollected. The householders in many parts of the city do not provide a garbage receptacle. In such cases garbage is fed to chickens, burned, buried, or too frequently thrown into the yard or alley, together with other household rubbish, for the collection of which the city has made no provision. Such a procedure is conducive neither to good health nor to good sanitation.

It is highly desirable that the city increase its equipment for the collection of garbage so that the entire area of the city may be adequately covered; that all householders be made to provide proper garbage receptacles and that there be provided adequate means to dispose of garbage by the installation of some modern system, preferably by reduction or incineration. Garbage from hotels, restaurants, commission houses, etc., should also be collected by the city.

When all of the garbage in the city is collected and the amount is augmented by the steady increase of population it is thought that to rely upon the farmer to cart it away will prove most unsatisfactory. It is therefore best to lay plans for a modern disposal plant in line with plants in other progressive cities. It is likewise desirable that the city institute a system for the collection of rubbish, including paper, tins, bottles, ashes, boxes, etc., which may be disposed of by filling in

low ground, as is at present done by collectors who receive their pay from the householder. There are special sites designated where refuse may be dumped, and the city employs a supervisor at each one of these places. It is understood that the supervisor may sort and recover such rubbish as may be sold as junk.

It is thought that \$35,000 per annum would be required to adequately collect and dispose of garbage and rubbish.

FOOD INSPECTION.

The inspection of foods, including places handling foods, is carried on by one inspector, who works under the supervision of the health officer, but who is detailed from and paid by the police department. He is responsible for the inspection of food products within the city only. The county health commissioner is expected to maintain a supervision over the milk-producing farms. There is, however, nothing in law or ordinance prohibiting a city official from carrying on such duties.

The Control of the Milk Supply.

Requirements of State regulations and ordinances.—The regulations of the State board of health contain a provision defining milk as the "fresh, clean lacteal secretion obtained by the complete milking of one or more healthy cows, properly fed and kept, excluding milk obtained within 15 days before and 10 days after calving, and which contains not less than eight and one-half (8.5) per cent of solids, not fat, and not less than three and one-quarter (3.25) per cent of milk fat." The regulations also define skimmed milk, etc., and specify that pasteurized milk is milk "that has been heated to a temperature of at least 145 degrees Fahrenheit for thirty minutes, or 165 degrees Fahrenheit for thirty seconds, and immediately cooled to 50 degrees Fahrenheit or lower." Provision is also made for the maintenance of cleanliness on producing farms and the methods to be used to produce clean milk.

City ordinances set a standard for milk which is higher than the standard required by the State. Under the city standard, milk containing more than 87 per cent of watery fluid or less than 13 per cent of milk solids, or less than 9.3 per cent milk solids exclusive of fat, is deemed below standard except during the months of May, June, July, and August, when milk containing less than 13 per cent of milk solids is regarded as of good quality.

The ordinance also places the inspection of milk in the health department; defines adulterated milk; provides for an assistant to the health officer to carry on milk inspection; requires that persons selling milk within the city secure a license; and provides for the collection and examination of samples. Penalties are also provided for any violation of the ordinance.

Method of procedure.—Milk is brought from the producing farms by collectors, who distribute it to the different milk dealers. It is therefore difficult at times to trace the milk back to the farm from which it came, as the collector may mix two or more partly filled cans. There are no provisions whereby pasteurization of milk is required; although there are 10 dealers who pasteurize their milk

YOUR PATRIOTIC DUTY—BUY A 1917 LIBERTY BOND.

before delivery. The methods used in pasteurization vary. Two dealers pasteurize by the flash and eight by the holding method. Some pasteurize in bulk, some in the can, and some in bottles. Temperatures vary from 160° for 5 minutes to 145° for 30 minutes. All bottle by machinery and cap by hand; but, no ordinance specifying to the contrary, dipped milk may be, and in fact is, sold. All are provided with some form of cooling apparatus. Many of the milk-distributing plants are not screened against flies. The inspection, however, was made in the winter, when such precautions are perhaps unnecessary. In several instances conditions surrounding the plant were such that flies would undoubtedly be present in great numbers in warm weather. It is probable that more than half of the milk supply of the city is pasteurized, but there are no accurate data on the subject. Milk samples are collected from the delivery wagons once each week. They are paid for, listed, and submitted to the laboratory for examination. An analysis of the results of samples examined during the year 1916 shows that of 393 samples 62.3 per cent contained 100,000 bacteria or less per cubic centimeter. The figures include both raw and pasteurized milk. Twenty-seven of the samples examined contained visible dirt. An inspection of producing farms was not made, as the time of year and the weather would have tended to make observations unreliable.

Inspection of Other Foods.

The food inspector also maintains a supervision over the sanitary condition of restaurants, groceries, stores, meat markets, public market, etc. An inspection made, in company with the food inspector, of a number of such places, disclosed satisfactory conditions as regards sanitation.

The local slaughterhouse is located just without the city limits. Animals slaughtered there undergo no ante or post mortem inspection. There are likewise a number of animals slaughtered elsewhere which do not undergo inspection. Inspection of animals before and after slaughtering should be provided for and to facilitate the operation the city ordinance should require that all animals be slaughtered at one place, and the sale of meat from cattle slaughtered under other circumstances, unless under United States Government supervision, should be prohibited. Arrangements might be made whereby farmers would be permitted to slaughter in the local abattoir, thus bringing all such matters to a central place where supervision could be readily maintained. It would be well to give careful consideration to the advisability of constructing a municipal abattoir.

YOUR PATRIOTIC DUTY—BUY A 1917 LIBERTY BOND.

Discussion.

It would be advisable for the local health department to maintain a supervision over the producing farms supplying milk to the city. This would mean that an additional inspector would have to be employed and that he would have to be supplied with some adequate means of transportation in the shape of an inexpensive automobile. This is the custom prevailing in most cities of any importance, and it would seem to be a logical arrangement, inasmuch as it is the city health officer who is responsible for the maintenance of the purity of the milk supply, and much better results may be hoped for when he is in a position to study the question throughout its various stages from the source of milk to the consumer. The work of a milk inspector is essentially educational in nature, and such an official in South Bend could combine the duties of a producing farm inspector as well as of a city milk inspector.

It would also be highly desirable to require that all milk be pasteurized before delivery to the consumer. The method of pasteurization should be that whereby milk is heated to 145° and held at that temperature for not less than 30 minutes and immediately cooled.

All pasteurizing plants should be equipped with a thermoregulator and temperature recorder, and a thorough study should be made from time to time of the technique of operation.

All milk should be sold in bottles unless in amounts of more than 5 gallons, when it may be sold in can. The sale of dipped milk should be prohibited. All cans of milk should be sealed at the producing farm and not opened, except by an official of the health department, until delivered to the distributor.

A bacterial standard should be set, which for pasteurized milk should be not more than 50,000 bacteria per cubic centimeter. If the sale of raw milk is continued, it should contain not more than 100,000 bacteria per cubic centimeter. Milk having a higher bacterial count than this should not be sold at all—not even after pasteurization.

It should not be difficult to comply with the above standards in a city the size of South Bend.

THE SANITARY POLICE.

Requirements of ordinance.—The ordinances prohibiting the maintenance of those conditions liable to produce a nuisance and providing for the abatement of nuisances are summarized as follows:

It is prohibited to spit or to throw rubbish on the sidewalk, entrance, stairway, hallway, steps, or any other public place or on the floors, walls, or in any street car, theater, depot, or depot platform. For violation there is provided a fine of not more than \$100.

YOUR PATRIOTIC DUTY—BUY A 1917 LIBERTY BOND.

It is prohibited to permit upon any premises any one of the following-named nuisances as liable to permit the breeding of flies: Animal manure in any quantity which is not securely protected from flies; privy vaults, cesspools, pits, or like places which are not securely protected from flies; trash, litter, rags, or anything whatsoever in which flies may breed or multiply.

It is the duty of the police or health officer upon learning of the existence of any of these nuisances to order the same abated. If the owner refuses or neglects to abate, the street commissioner is authorized to act and to charge the cost as a lien against the property. Any person creating, or permitting to exist, any nuisance as above is liable to a fine of not less than \$5 nor more than \$100.

It is prohibited to maintain a pigpen in the city limits.

It is prohibited to throw rubbish, offal, dead animals, etc., into the St. Joseph River.

It is unlawful for any person to maintain any condition within the city limits which may be offensive or injurious to the health or comfort of the people of the vicinity, or to permit the collection of any offal or filth that may be offensive to the public.

It is the duty of every owner of real estate to cut and haul away weeds growing upon his premises. Where the same is neglected or refused after receipt of the proper order from the board of health, the street commissioner is authorized to cut the weeds and charge the cost as a lien against the property.

The board of health or its deputies and the city police are authorized to enter any street, lot, alley, or premises or ground for the purpose of making a sanitary survey of the same. If a nuisance is found the person committing such nuisance must be notified, and if he fails to abate the same within the specified time the street commissioner has authority to abate the nuisance and charge the expense as a lien against the property. It is the duty of the police officers to aid the board of health in enforcing the above ordinances. For violation there is provided a fine of not less than \$5 nor more than \$100, to which may be added imprisonment.

It is prohibited to conduct or maintain any slaughterhouse within the city limits or within 2 miles of the city limits.

Method of procedure.—The sanitary inspectors, two in number, are policemen detailed from and paid by the police department. These two officers, in addition to placarding and fumigation, are mainly engaged in a supervision over the sanitary condition of the environment in which people live. As already pointed out, there are no officials in the health department to help the individual who is sick and to supervise the prophylactic measures to be taken at the bedside.

During 1916 there were 865 complaints filed with the health department and investigated by the sanitary inspectors. In practically every case where the complaint was found justified either a verbal or written notice was issued to abate the nuisance. The following table indicates the various conditions complained of:

Filthy houses, stores, markets.....	15
Insanitary sinks and toilets.....	9
Filthy alleys.....	10
Filthy yards.....	32
Insanitary vaults, cesspools, etc.....	346
Fowls, etc.....	41
Uncut weeds.....	64

Accumulation of refuse:

Garbage.....	72
Ashes.....	27
Rubbish.....	40
Manure.....	52
Unfounded complaints.....	20
Miscellaneous complaints.....	137
Total.....	865

In addition to the above the sanitary inspectors placarded 933 houses and performed 446 fumigations.

There should be some arrangement whereby each member of the police force could cooperate with the health department by noting insanitary or unsightly conditions and remedying such conditions before it became necessary to make a complaint to the health department.

With a staff of visiting nurses it would be possible to relieve the sanitary police of the duty of placarding houses and much of the fumigation.

THE HOUSING PROBLEM.

On account of the interest taken in the housing problem by certain citizens of the community of South Bend it was decided to investigate this subject more intensively than is customary. After a study of the spot maps showing the location of deaths from tuberculosis and deaths in children under 1 year of age, it was decided to secure the necessary data from a district in each of wards 3 and 6.

Ward.	Number of births.	Number of deaths of infants under 1 year.	Infant mortality rate.	Number of deaths from tuberculosis.
1.....	204	17	83.3	15
2.....	313	33	105.4	23
3.....	118	13	110.1	13
4.....	255	27	105.8	8
5.....	68	9	132.3	7
6.....	479	67	139.0	24
7.....	398	37	97.7	20

A study was made of 479 houses located in these districts as well as houses in other parts of the city. In addition there were a number of premises inspected where for one reason or another it was impracticable to secure admission to the house. It was at first intended to secure information on a greater number of houses, but as the work progressed it was found that additional data merely served to emphasize results already obtained. The weather was not entirely suited to a housing survey, as much of the time the ground was frozen and snow covered, and no doubt some of the conditions which will prove

YOUR PATRIOTIC DUTY—BUY A 1917 LIBERTY BOND.

objectionable in the spring were overlooked. The survey has disclosed some interesting things which it would be advisable for the city to take hold of immediately, not only to correct but to prevent a recurrence of in the future.

Conditions found on the premises compel one to state that an unnecessarily large portion of South Bend is rural in character. The small frame house, the insanitary privy in the shape of an unscreened cesspool, the shallow well, the absence of a garbage tin, the accumulation of rubbish and garbage, the small insanitary stable, and the presence of chickens are characteristic of rural rather than urban communities. Such conditions have no place in a properly organized municipality. Most of the streets on which the cesspools and wells were found are provided with sewers and with city water, but connections with the same have not been insisted upon.

The ordinances relating to cesspools and sewer connections, while seemingly thorough, are in reality inadequate, as a provision makes it lawful to maintain an already constructed cesspool where it is not within 50 feet of a dwelling. The best the health department can do in such cases is to order it cleaned when full or objectionable.

There are great numbers of small one or two story frame houses in the city. They are usually detached and have light and ventilation on all sides; therefore, from the standpoint of health, block congestion does not exist, although as a fire risk the danger is imminent. Instances of inside rooms are rare and tenement houses are uncommon. There are a few houses which are to all intents and purposes tenements, but which, by reason of the limitation of the State housing law, can not be brought under that class. Houses in which two families live and which were planned for only one are frequently encountered. Instances are also observed where houses have been erected or moved onto a lot to the rear of another house. In a few instances private courts have been opened on which have been built houses of inferior type. On one of these courts was an example of an inside room in two of four small one-story houses with common partition walls and without modern plumbing. Instances of houses in a dilapidated condition and being used as residences are to be seen. Examples of inside sleeping rooms were observed in two lodging houses.

It will be noticed from the tabulation that the average number of persons per house in the districts investigated was 6 in ward 6 and 4.9 in ward 3. The former figure is above the usual average. Both wards are populated largely by foreigners. However, in ward 3 there are a greater number of houses occupied by the better class and there are a greater number of American families. The average

YOUR PATRIOTIC DUTY—BUY A 1917 LIBERTY BOND.

number of persons per sleeping room was 2.4 in ward 6 and 1.8 in ward 3, showing the greater tendency in the former case to crowd into one room. Similar figures computed on the basis of a given number of houses per block do not show such a marked discrepancy because the block used in ward 3 did not happen to contain houses of the better class. Practically every bedroom had one or more windows which, if kept open, would tend to nullify the evil effects of overcrowding, but unfortunately because of ignorance the windows are usually tightly closed.

It is not the intention to enter into a discussion relative to the effect of poor housing conditions on health or morals. The bad influence is too well known to need repetition. Suffice it to say that better housing conditions should be provided for those residents in South Bend who are in poor circumstances.

Here it would not be out of place to point out that in building dwellings to rent to the poor who can afford to pay only \$6 to \$8 per month, the element of profits should be given but minor consideration. The housing problem under such circumstances becomes either a governmental one, as it is in England, or one of private philanthropy, where the owner is satisfied with a very small return on money invested. It is only when an owner refuses to do anything to maintain a dwelling in a condition fit for human habitation that larger profits may be made from property erected to rent at a low figure. Such property soon becomes out of repair, but nevertheless is rented and occupied by someone, even to the point where total destruction by fire or condemnation and vacation offer the only hope of replacing it with something better.

In relation to housing, the following suggestions are offered:

The State housing law should be amended so that its provisions would apply to lodging houses, boarding houses, etc., and the procedure to be taken in the condemnation and vacation of insanitary or unsafe buildings should be simplified.

The erection of tenement houses should be discouraged, and detached dwelling houses to house one or at the most two families should be erected.

Where a house is planned to accommodate two families, each family should be provided with a separate entrance and separate toilet facilities.

The minimum plumbing fixtures installed in any house should be one flush closet and one sink for each family. Any house which is not worth the expense of making such installations is not fit to live in.

It should be prohibited to open up any district within the city limits for building purposes until sewers and water mains are laid.

The fire limits should be greatly extended.

YOUR PATRIOTIC DUTY—BUY A 1917 LIBERTY BOND.

The insanitary privy should be abolished and houses should be provided with modern plumbing properly connected to the sewer.

The surface well should be eliminated and all houses made to utilize the city water supply.

Adequate ordinances should be promulgated requiring a license to conduct a boarding or lodging house, etc., and defining overcrowding—i. e., light, ventilation, and cubic air space for each individual in the case of houses used as above, as well as in those instances where single dwellings are being used for two or more families. Adequate toilet facilities should also be provided for. Inside rooms should be prohibited.

It should be prohibited to erect or move a house onto any rear lot or lot facing an alley.

It should be prohibited to erect or to move any house onto a lot facing a court. The presence of courts should not be tolerated.

It should be prohibited to make structural alterations in any house without approval of the building commissioner.

Adequate regulations should be promulgated providing for the construction and maintenance of stables and the disposal of manure.

Every householder should be made to provide a proper garbage tin and a receptacle for rubbish; and the city should extend its system of garbage collection and establish a system for the collection of rubbish.

A corps of nurses should be established in the health department, who during their visits to the homes for various purposes could act as educators and instruct the people in the right way of living.

	Ward 6.	Ward 3.	Out- side.
Total number of houses and premises inspected.....	227	252	42
Total number of houses owned.....	141	73	13
Total number of houses rented.....	71	175	29
Number of families to one house:			
One family.....	205	205	37
Two families.....	19	44	9
Three families.....	2	2	1
Four families.....	0	1	0
Five families.....	1	0	1
Number of families taking lodgers.....	24	63	6
Number of premises with surface well.....	180	117	26
Number of houses with flush toilet.....	36	98	4
Number of houses with sinks.....	44	120	3
Number of houses with bathtub.....	24	50	1
Number of premises with privy vaults.....	183	101	35
Number of with long hopper closet.....	3	22	0
Number of premises having chickens.....	158	26	8
Number of premises with garbage tins.....	22	87	7
Number of premises with other garbage receptacle.....	5	5	0
Total number of people in houses inspected.....	1,376	1,242	194
Average number per house.....	6	4.9	4.6
Total number of rooms in houses inspected.....	1,374	1,363	207
Average rooms per house.....	6	5.4	4.9
Total number of sleeping rooms in houses inspected.....	566	683	86
Average persons per sleeping rooms.....	2.4	1.8	2.2

YOUR PATRIOTIC DUTY—BUY A 1917 LIBERTY BOND.

	Ward 6.	Ward 3.	Out- side.
Number of families to toilet:			
One family.....	197	148	25
Two families.....	21	69	12
Three families.....	2	1	1
Four families.....	1	1	0
Five families.....	1	2	1
Number of inside sleeping rooms.....	3	2	0
Number with sanitary conditions of premises bad.....	40	67	.....
Number with sanitary conditions of house bad.....	26	60	.....
Number of families personal cleanliness bad.....	32	54	.....
Number of houses defective structurally.....	20	2	.....

Information relative to houses inspected, by blocks.

	13 houses.	41 houses.	57 houses. ¹	21 houses.
Number of bedrooms.....	20	66	122	36
Number with one window.....	17	51	67	21
Number with two windows.....	3	15	54	15
Number with three windows.....	0	0	1	0
Total number of occupants.....	58	173	300	88
Average number of occupants per bedroom.....	2.9	2.6	2.4	2.4
Average cubic capacity of bedrooms.....	1,362	1,202	1,003	900
Average cubic feet air space per occupant.....	² 469	³ 458	⁴ 407	⁵ 368

¹ One room with one window, 1,234 cubic feet and 6 persons; one room with one window and 5 persons, 1,512 cubic feet.

² One room with one window, 960 cubic feet and 5 persons; two rooms each with one window, 720 cubic feet and 3 persons.

³ Two rooms each and one window, 640 cubic feet and 5 people.

⁴ Two rooms each with one window, 640 cubic feet and 4 people.

⁵ A block equals two of ordinary size.

DISSEMINATION OF INFORMATION.

The local board of health publishes an annual report. No bulletins of a popular nature are issued. During the year 1916 there were printed for distribution among the pupils of the public and parochial schools circulars of information in Polish, Hungarian, and English relative to quarantine procedures.

At various times during the year the health officer has given popular talks on the subject of public health before clubs, churches, schools, and other gatherings.

The local health organization also lent its assistance to the charitable organizations that were in charge of the "Better-baby week."

HEALTH SUPERVISION OF SCHOOLS.

There are at present employed by the board of education two school nurses, who are engaged in the usual work of a school nurse. One of these nurses has been employed for approximately a year and has been working under the supervision of the visiting nurse association, and will continue under their supervision until the end of the school year. The second nurse was employed only from the beginning of the year 1917 and works under the supervision of the board of education. This board expects to employ a third nurse at the be-

YOUR PATRIOTIC DUTY—BUY A 1917 LIBERTY BOND.

ginning of the next school year, at which time the entire nursing staff will come under the supervision of the school authorities.

There are no medical inspectors, but, when necessary, children are taken by the nurses to certain of the doctors of the city who give their professional services free of charge in indigent cases. When the occasion arises, as, for instance, in the case of an epidemic, the school authorities employ physicians temporarily.

The board of education is now equipping a dental dispensary so that the teeth of the pupils may receive necessary attention. The dentists of the city have volunteered for the time being at least to give their services without cost.

It is to be hoped that after a full-time health officer is employed the city health department will establish a corps of nurses for public-health work, and that when this is done the board of education will see fit to combine its force of nurses with that of the health department, thus making it possible to do much more efficient work along the lines of public health than could be done by two nursing staffs under separate heads.

EXPENDITURES AND APPROPRIATIONS.

There was expended by the city health department during the year 1916 the sum of \$12,204.08. The salaries of two sanitary policemen and one food inspector, though paid by the police department, have been charged against expenditures on account of the public health. A table in more or less detail follows, segregating the different items paid out of health-department funds.

The assessed valuation of property in the city of South Bend is \$31,471,710, of which \$23,468,500 is the assessment on real and \$8,003,210 on personal property. Property is assessed at 40 per cent of its actual value. The tax levy for the maintenance of city government, exclusive of the public schools, is 12.9 mills. This produces an income of \$401,333, of which \$314,222 may be used for general maintenance. To this must be added the income from miscellaneous receipts, amounting to \$106,568, making a total of \$420,790. The amount is not sufficient to properly maintain a progressive government in a city of the size and importance of South Bend. Most of the charitable work of the city, as well as a large amount of public-health work, is done through private philanthropy. The city should be in a position to take over such activities as are now carried on by private organizations and which are strictly governmental. Among these may be included the antituberculosis work, the work of the visiting-nurse association, and the children's dispensary. The only charitable work performed by the city of South Bend is the maintenance of

YOUR PATRIOTIC DUTY—BUY A 1917 LIBERTY BOND.

indigents in quarantine and the support of those indigents who may be sent to the local private hospitals in emergencies. The city should allot at least 5 per cent of its available revenues to the support of the health department alone. This would immediately make available the sum of \$21,039.50, with which it is thought a small but creditable health department could be organized and maintained. This sum should be spent about as follows:

One full-time health officer.....	\$2, 500. 00
Two sanitary inspectors, at \$900.....	1, 800. 00
One food inspector.....	900. 00
One dairy inspector.....	900. 00
Five public-health nurses, at \$900.....	4, 500. 00
Three members of board of health, at \$100.....	300. 00
One clerk.....	720. 00
One caretaker, isolation hospital.....	1, 080. 00
Maintenance, diagnostic laboratory.....	1, 500. 00
Transportation.....	1, 000. 00
Expenses printing, supplies, quarantine, postage, dispensaries, etc.....	5, 839. 50
	<hr/>
	21, 039. 50

Twenty-one thousand and thirty-nine dollars and fifty cents is little enough to spend in the prevention of disease, and represents less than three-fourths of a mill tax levy. During the year 1916, 34.4 per cent of the city's revenues went for fire and police protection, as against 2.9 per cent to protect the health of the citizens of the community.

The amount recommended for the health department would enable the city to perform, through its full-time health officer and corps of nurses, work along the lines of infant welfare and the control of communicable diseases, including antituberculosis activities, thus relieving private philanthropy from a burden which it should not have to bear.

YOUR PATRIOTIC DUTY—BUY A 1917 LIBERTY BOND.

Tabulation of expenditures, calendar year 1916.

	Board of health.	General administration.	Epidemiological activities.				Registration of births and deaths.	Milk and food inspection.	Sanitation.	Plumbing inspection.	Educational.	Total.
			General.	Diagnostic laboratory.	Isolation hospital.							
Antitoxin.....			\$419.87					\$6.00	\$213.53	\$125.00		\$419.87
Cost of transportation.....			324.00		\$0.80							344.53
Drugs, chemicals, and disinfectants.....			185.00							5.00		324.80
Emergency services.....							\$3.09	.55			\$1.90	190.00
Express.....												5.54
Furnishings.....					12.72							12.72
Insurance.....					27.80							27.30
Lectures.....											103.00	103.00
Maintenance of families in quarantine.....			1,032.92					26.92				1,032.92
Maintenance of patients in hospital.....			45.00		106.00			1.03	1.95	29.95		151.00
Milk samples.....							38.60					26.92
Miscellaneous.....			1.30									34.23
Office supplies.....												38.60
Postage.....			\$12.00								1.50	13.50
Printing.....			5.00								9.00	192.00
Repairs and alterations.....			37.00		176.26			34.25	17.10	89.65		176.26
Salaries:												
Members board of health.....	\$300.00											7,359.72
Health officer.....		1,359.72						1,900.00	1,800.00	1,200.00		
Inspectors.....					1,080.00							
Clerks.....		720.00										
South Bend Medical Laboratory.....				\$1,500.00								1,500.00
Stationery.....		30.82					6.10					36.92
Telephone and telegraph.....			2.75		24.00				6.50			33.25
Traveling expenses.....		46.00						15.00				61.00
Visiting nurse association.....			100.00									100.00
Total.....	300.00	2,173.54	2,167.84	1,500.00	1,427.08		47.79	983.75	2,039.08	1,449.60	115.40	12,204.08

1 Paid by police department.

RECOMMENDATIONS.

As the result of a careful study of public-health administration in South Bend extending over a period of about two months, certain definite conclusions have been reached and are made the basis of the following recommendations:

1. That there be appointed for the city of South Bend a full-time health officer at a salary of not less than \$2,500 per annum, and that he receive a reappointment at the end of each successive four-year period so long as he renders efficient service to the city.

2. That for purposes of administration the health department be divided into the following-named divisions: The board of health, the executive office, epidemiological, sanitary inspection, milk and food inspection, birth and death registration, and diagnostic laboratory.

3. That in addition to the administrative work the health officer be required to carry on the necessary epidemiological investigations in the case of typhoid fever, scarlet fever, diphtheria, and tuberculosis, and to render the necessary professional services at the dispensaries of the health department.

4. That there be established in the health department an anti-tuberculosis and a child welfare dispensary.

5. That there be employed by the health department not less than five public-health nurses, whose duties will be the field work in connection with child welfare, prenatal nursing, and a supervision over the preventive measures to be taken at the home in the case of certain of the communicable diseases.

6. That each nurse be given a district in which she shall perform all of the public-health duties required.

7. That the health department furnish disinfectants free of charge to families in which there is a case of typhoid fever, and antituberculosis supplies in the case of tuberculosis.

8. That the health department administer antityphoid vaccine free of charge to those making application.

9. That in the case of diphtheria, cultures from the throat and nose be taken from all contacts, including pupils from public and other schools.

10. That typhoid fever be made a placardable disease.

11. That the scope and amount of work performed by the laboratory be increased and that the laboratory cooperate more thoroughly with the health department.

12. That in order to more thoroughly study and supervise the milk supply of the city of South Bend, there be employed a milk and dairy inspector, and that the present inspector be designated "food inspector," to have special supervision over foods and places handling food other than milk.

13. That all milk sold in the city of South Bend be pasteurized.

14. That more adequate ordinances be enacted to maintain the purity of the milk supply.

15. That automobile transportation be furnished to the full-time health officer and to the milk inspector.

16. That an isolation hospital of not less than 20 beds be established by the city health department for the isolation of those common communicable diseases that can not be properly handled in the home.

17. That after a corps of nurses has been added to the health department the public-health work now being done by the anti-tuberculosis league and children's dispensary be discontinued.

18. That all surface wells within the city be eliminated.

19. That all privy vaults within the city be abolished and that all premises be made to install flush closets connected with the sewer.

20. That the council appropriate a sufficient sum of money to defray the expense of installing plumbing in houses where the people can ill afford to pay for it, the expense so incurred by the city to be charged as a lien against the property to be paid off in easy installments.

21. That the office of the plumbing inspector be transferred to the building inspector's division.

22. That the cooperation of the police force be obtained to investigate nuisances and to issue the necessary orders to abate the same.

23. That the equipment for the collection of garbage be increased so that all garbage from the city may be collected, including that from hotels, commission houses, etc.

24. That as soon as possible the city organize a system for the collection of rubbish.

25. That all householders be required to furnish a proper receptacle in which to place garbage and another receptacle for rubbish.

26. That active steps be taken to improve housing conditions as indicated in the body of the report.

27. That all citizens of the city cooperate with the health department in its efforts to suppress disease, and that physicians make special effort to report promptly all cases of communicable diseases.

28. That provision be made for the construction of a municipal abattoir, a reduction plant, and a sewage-disposal plant.

29. That 5 per cent of the available revenues of the city, or \$21,039.50, be appropriated to the health department to be spent as indicated in the body of the report, and that \$35,000 be appropriated to the board of public works to be used for the collection and disposal of garbage and rubbish.

30. That better office space be provided for the health department.

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